# DEVICE FOR MANUFACTURING AND FEEDING PACKING BLANK


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| **Inventor:** | HAINTSU FUOKU; KURUTO RAITOKE |
| **Applicant:** | FOCKE & CO |
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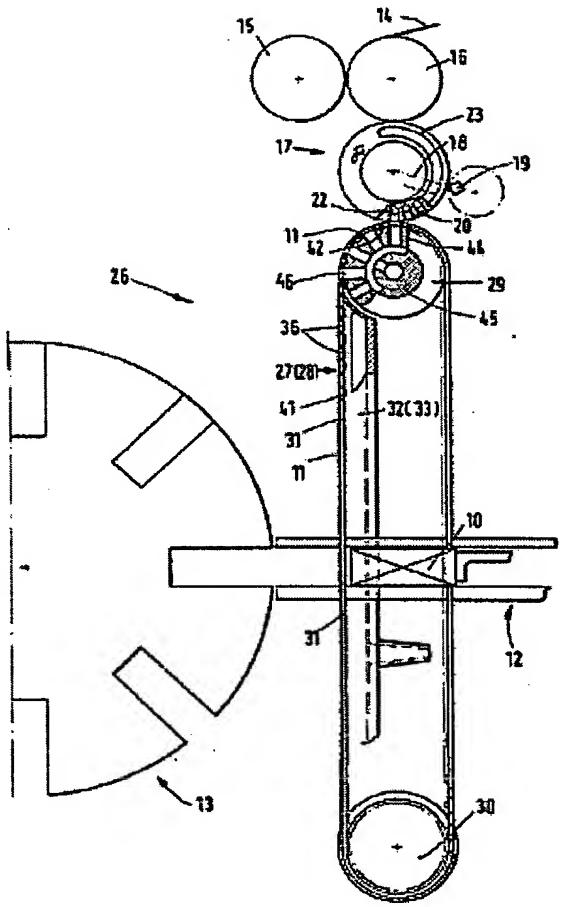
- DE3131687 (A
- EP0071736 (B
- EP0071736 (B





Abstract not available for JP58041018
Abstract of correspondent: **US4495746**

The efficient machine conveyance of inexpensive, very thin-walled packaging material, especially plastic foils, presents special problems because of the low degree of firmness of these foils. In the present apparatus, the front end of a sheet of such material and blanks severed from it are transported continuously by suction air conveying members. These consist of a suction drum and perforated belts directly adjoining the drum, with no interruption occurring in the retention of the packaging material.

# DEVICE FOR MANUFAC[redacted]RING AND FEEDING PACKING B[redacted]NK

Description of correspondent: **US4495746**

## BACKGROUND OF THE INVENTION

The invention relates to a packaging apparatus for producing blanks by severing them from a sheet of material and for feeding them to a packaging station by means of a blank-conveyor which consists of revolving laterally perforated belts with a conveying side for the blanks which is under a vacuum as a result of suction chambers arranged on the rear face.

For the processing of packaging materials with "critical" properties in packaging technology, special measures are necessary to fix sufficiently the foils or blanks made from them during conveyance. At the same time it is important to guarantee uninterrupted retention both of the continuous sheet of material and of the blanks severed from it, until they are wrapped round the article to be packaged.

A first solution to this problem can be found in German Pat. No. 1,169,361 issued on Apr. 30, 1964. In this proposal the sheet of material is fed to a suction roller, on the outer shell surface of which suction bores open. The blanks are severed from the sheet of material on this suction roller by a revolving severing knife. The individual blanks are then transferred from the suction roller to lateral suction discs on the same axis, which likewise fix the blank laterally by means of suction bores. The article (pack) can be moved through between these suction discs in a radial direction, specifically carrying with it the blank which is pulled off from the suction discs as a result of slipping.

The use of suction discs as a retaining and conveying member for the blanks has proved unfavourable because they are expensive to produce and are tied to specific maximum dimensons. In addition, when the blank (of appropriately large dimensions) loops substantially round the suction discs, it becomes more difficult for the conveyed pack to pull it off from the suction discs.

Consequently, more recent solutions (U.S. Pat. No. 4,151,699 and German Offenlegungsschrift No. 2,949,685 of Dec. 11, 1979) work with laterally perforated belts, the conveying side of which is likewise exposed via suction chambers fixed in place to a vacuum which retains the blank and carries it along. A vertical plane conveying path for the blanks is possible by means of the perforated belts. This path can have sufficient length for separating the necessary conveying and packaging members from one another. Also, it is easier to pull a blank off from the vertical perforated belts by means of a pack conveyed transversely to it.

However, in the known apparatuses with perforated belts of this type, the problem of severing the blanks from the sheet of material, whilst keeping them fixed continuously, has not yet been solved in the best possible way.

## SUMMARY OF THE INVENTION

Consequently, the object on which the invention is based is to propose measures, by means of which, on the one hand, uninterrupted conveyance of the sheet of material and of the severed blanks until they are received by a pack or the like is guaranteed, with, at the same time, a simple and functionally reliable construction, and, on the other hand, a straightforward cut severing the blank completely from the sheet of material can be made.

To achieve this object, the apparatus according to the invention is characterised in that located in front of the blank-conveyor is a suction drum known per se, in the region of which the blanks can be severed from the sheet of material and by means of which the blanks can be transferred directly to the perforated belts. In particular, the suction drum is located in the region of an (upper) deflecting roller for the perforated belts, in such a way that the peripheral surface of the suction drum or the blank conveyed thereon can be transferred directly to the peripheral surface of the deflecting roller of the perforated belts or to the belts themselves. At the same time, the invention ensures that the deflecting roller for the perforated belts is subjected to suction air at least in a peripheral region serving for transporting the blank.

In the invention, therefore, two different conveying systems, namely a suction roller for making the severing cut when the blank is produced, on the one hand, and perforated belts for conveying the blank up to the packaging station, on the other hand, are placed in such a spatial relationship to one another that the blank severed on the suction drum can be transferred directly and without an intermediate conveyor to the suction belts appropriately closely adjacent thereto. The transition from conveyance of the blanks

along a path in the form of [redacted] arc (over part of the periphery of the d[redacted]roller) to a plane conveying path (by means of th[redacted]forated belts) takes place in an especially fa[redacted]able way in the invention since the perforated belts already run underneath the blank in the region of the deflecting roller.

The suction air retaining the blank on the deflecting roller can be brought up to the blank in various ways. According to an advantageous embodiment, the deflecting roller is provided with (radial) suction bores which preferably correspond to suction holes in the perforated belts. In this case, the suction air is transferred to the blank through or via the perforated belts in the region of the deflecting roller also.

According to an embodiment which is also advantageous, the suction chambers assigned to the perforated belts are prolonged into the region of the deflecting roller for the perforated belts, to form suction segments in the form of circular arcs. These extend in a peripheral groove of the deflecting roller in such a way that the outwardly open side of the suction segments can take hold of the blank (directly or via the perforated belts).

Finally, it is possible to place the suction drum directly on the vertical conveying side of the perforated belts, in such a way that the severed blanks are transferred from the suction drum directly to the perforated belts conveying downwards.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows, partially in vertical section, a simplified side view of an embodiment of the apparatus,

FIG. 2 shows, also partially in vertical section, a front view of the apparatus according to FIG. 1, offset 90 DEG,

FIG. 3 shows, in a side view and in vertical section, the upper region of the apparatus according to FIGS. 1 and 2 on an enlarged scale,

FIG. 4 shows a horizontal section through the apparatus in the region of perforated belts and suction chambers, on an enlarged scale,

FIG. 5 shows a front view relating to the detail according to FIG. 3 offset 90 DEG,

FIG. 6 shows a representation corresponding to FIG. 3 of another embodiment of the apparatus,

FIG. 7 shows a front view offset 90 DEG, partially in section, of the embodiment according to FIG. 6,

FIG. 8 shows a representation corresponding to FIG. 7 of a modified embodiment of the apparatus,

FIG. 9 shows a representation corresponding to FIG. 3 and FIG. 6 of a further embodiment.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The devices illustrated are parts of a packaging machine for producing cigarette packs 10 provided with an outer wrapping of an inexpensive plastic foil which presents packaging problems. For this purpose, a blank 11 of packaging material is kept ready on a pack track 12 in a plane transverse to the direction of transport of the cigarette pack 10, in such a way that the blank 11 wraps itself in the form of a U round the cigarette pack 10 as a result of the relative movement. The cigarette pack provided with a blank 11 in this way is then conveyed into a folding turret 13 which makes the further necessary folds of the blank 11 in a known way.

The blanks 11 are severed successively from a sheet of material 14 conveyed continuously (or intermittently). This sheet of material is conveyed by means of a pair of drawing rollers 15, 16 mounted above following conveying members. After the sheet of material 14 has been conveyed along approximately half the periphery of one drawing roller 16, it is transferred to an adjoining, parallel axis suction drum 17.

On the suction drum 17, the blank 11 is severed from the following sheet of material 14. In the present embodiment, an approximately radially directed severing knife 18 is embedded in the suction drum 17 in such a way that its outer cutting edge projects beyond the shell surface of the suction drum 17. The severing cut is made by means of a revolving counter-knife 19 at a predetermined and recurring cutting point, so that blanks of always the same length are severed. The above-mentioned severing device can

also be designed in a diffe[redacted]

The revolving suction drum 17 is equipped with radial suction bores 20 which open onto the shell surface of the suction drum 17 in several, preferably three suction rows 21 located at a distance from one another and which, when subjected appropriately to suction air, fix the sheet of material 14 or the blank 11. The suction bores 20 of the three suction rows 21 are each connected to common parallel axis suction channels 22 which lead to an axial end of the suction drum 17 and communicate periodically with a suction groove 23 formed in a fixed distributor disc 24 mounted next to the suction drum 17. The suction groove 23 extends over the entire approximately semi-circular conveying region of the sheet of material 14 or of the blank 11 on the suction drum 17. Advantageously, in the lower region, there is formed in the distributor disc 24 a vent bore 25 (FIG. 9) which is separate from the suction groove 23 and which, as a result of venting the suction channels 22 and consequently the suction bores 20 in this region, makes it easier to transfer the blank 11 to a following blank-conveyor 26.

By means of this blank-conveyor 26, the blank 11 is transported in a straight line, namely in a vertical plane. For this purpose, the blank-conveyor 26 consists of two perforated belts 27 and 28 arranged at a distance from one another. These are guided over upper and lower deflecting rollers 29 and 30. In the present case, the arrangement is such that the deflecting rollers 29 and 30 are disposed approximately at equal distances above and below the pack track 12.

The perforated belts 27, 28 are subjected to suction air in the region of a conveying side 31, specifically either by means of individual elongate suction chambers 32 and 33 for each conveying side 31 or by means of a common suction box 34 (FIGS. 6, 7 and 8). The suction chambers 32, 33 are provided on the side facing the conveying side 31 with orifices or a continuous suction slit 35 which is covered by the conveying side 31 of the perforated belts 27, 28. In the region of the suction slit 35, the perforated belts 27, 28 are provided with suction holes 36 which enable the vacuum to be made effective by means of the suction chambers 32, 33 or the suction box 34 on the opposite face of the conveying side 31, so that the blank 11 is fixed during transport.

As is evident especially from FIG. 4, in this embodiment the suction chambers 32 and 33 are formed in vertical supporting elements 37, between which a recess 38 is formed for pushing through the cigarette pack 10. During this pushing-through movement, the blank 11 is pulled off from the conveying sides 31 of the perforated belts 27,28 by the cigarette pack 10.

The perforated belts 27, 28 run in trough-like depressions 39 in the suction chambers 32, 33 or the suction box 34. The narrow depressions 39 are calculated so that the perforated belts 27, 28 running in them terminate approximately flush with the contact surface 40 facing the blank 11. The suction holes 36 in the perforated belts 27, 28 and the suction slits 35 for the suction chambers 32, 33 are arranged offset inwards in relation to the longitudinal centre planes of these parts.

The perforated belts 27, 28 are provided, on the inner face turned towards the deflecting rollers 29 and 30, with transversely directed rib-like elevations 41, as a result of which the perforated belts 27, 28 are designed as toothed belts. At least the upper deflecting roller 29 is equipped with corresponding depressions 42 into which the elevations 41 engage positively. Because of this, an exact movement of the perforated belts 27, 28 which is slip-free in relation to the deflecting rollers 29, 30 is guaranteed. The depressions 42 are formed in the region of turned-in portions 43 of the deflecting rollers 29, 30. These turned-in portions 43 or flat grooves are designed so that the perforated belts 27, 28 fit in them and terminate essentially flush with the shell surface of at least the deflecting roller 29. A suction hole 36 is located between every two elevations 41.

The present embodiments are designed so that from the take-over of the sheet of material 14 by the suction drum 17 up to the transfer of the blank 11 to the cigarette pack a continuous and uninterrupted fixing of the sheet of material 14 and of the blank 11 to the conveying members concerned by means of suction air is guranteed. The transfer of the blanks 11 formed on the suction drum 17 to the blank-conveyor 26 is achieved in a special way.

In the embodiment according to FIG. 1 and the following figures, the upper deflecting roller 29 of the blank-conveyor 26 is subjected to suction air in the region of the shell surface, specifically at least in a peripheral region serving for conveying the blank 11. Preferably, the suction air is here brought up to the blank 11 via the perforated belts 27, 28 so that the blank 11 is already decisively transported by the perforated belts 27, 28 in the region of the deflecting roller 29.

In this embodiment, the deflecting roller 29 consists of a hollow cylinder 44 which is mounted rotatably on a fixed supporting axle 45. This has, at the same time, the task of supplying vacuum to the deflecting roller 29. The hollow cylinder 44 is equipped with radially directed suction bores 46 which respectively open onto

the shell surface of the hol[illegible]der 44 in the region of the suction holes [illegible] perforated belts 27, 28. The suction bores 46 are co[illegible]ted to a vacuum system in the supporting a[illegible]5, namely to a segmental groove 47 extending in a peripheral direction in the region of the suction bores 46. This is arranged and calculated so that the suction bores 46 are connected to the segmental groove 47 over the region of transport for the blank 11. This segmental groove is, in turn, connected via a radial bore 48 to a central axial bore 49 in the supporting axle 45. Consequently, by connecting the latter to a vacuum source, the segmental groove 47 is subjected constantly to suction air. The blank 11 is taken over by the deflecting roller 29 in the upper region of the latter in the closest proximity to the suction drum 17. Conveyance on the deflecting roller 29 extends approximately along a quarter circle.

The design of the transport apparatus described this far permits a favourable arrangement of the conveying members, in such a way that the sheet of material and blanks are transported, until they are received by the perforated belts, on arcuate tracks adjoining one another. For this purpose, in the embodiments according to FIGS. 1 to 8, the deflecting roller 29, suction drum 17 and drawing roller 16 are arranged above one another in a common axial plane. As a result, a favourable synchronous drive of these conveying members is also possible, as is evident especially from FIG. 5. The suction drum 17 and deflecting roller 29 are directly engaged operatively with one another via gear wheels 50, 51. A further gear wheel 52, serves for driving the drawing roller 16. The suction drum 17 is mounted at both ends on a continuous axle 53. Here, the supporting axle 45 of the deflecting roller 29 is mounted on one side.

The embodiment according to FIGS. 6 to 8 is, in principle, designed in the same way as that according to FIGS. 1 to 5. Here, the blank 11 is fixed to the upper deflecting roller 29 by means of suction air in a different way. As is evident especially from FIG. 6, the suction box 34 provided here is prolonged into the region of the deflecting roller 29, specifically by narrow suction segments 54, 55, shaped in the form of circular arcs and adjoining the suction box 34. These are designed, here, as relatively narrow trough-like air-conveying members of actually U-shaped cross-section. The fixed suction segments, 54, 55 extend in correspondingly shaped and dimensioned peripheral grooves 56 and 57 respectively in the deflecting roller 29. The differences in dimension are selected so that the deflecting roller 29 is freely rotatable relative to the suction segments 54, 55. The radially outer side of the suction segments 54,55 is open, thus forming a suction slit 58.

In the embodiment according to FIG. 7, the suction segments 54 extend underneath the perforated belts 27, 28, namely in the region of the air suction holes 36. Here, therefore, in a way similar to the embodiment according to FIGS. 1 to 5, the perforated belts 27, 28 are subjected to suction air in the region of the deflecting roller 29 also, so that they can even here fulfil their conveying and fixing function in relation to the blank.

In the embodiment according to FIG. 8, fixing of the blank and the conveyance thereof are separated from one another in the region of the deflecting roller 29. Here, the suction segments 55 are arranged offset laterally, namely inwards, in relation to the perforated belts 27, 28. For this purpose, the suction segments 55 terminate essentially flush with the shell surface of the deflecting roller 29, so that here the suction slits 58 can act directly on the blank 11.

Moreover, here, the conveying members 16, 17, 29 are in the same or similar positions relative to one another as in the embodiment previously described. The suction box 34 is designed in a similar way to the suction chambers 32, 33 as regards the guidance of the perforated belts 27, 28.

FIG. 9 shows an alternative embodiment in which the blanks 11 produced likewise by means of a severing cut on the suction drum 17 are transferred directly by the suction drum 17 to the perforated belts 27, 28 in the region of the (vertical) conveying side 31. For this purpose, the suction drums 17 is mounted underneath the upper deflecting roller 29 closely adjacent to the perforated belts 27, 28 in the upper region of the conveying side 31, in such a way that the blanks 11 running off from the periphery of the suction drum 17 are transferred directly to the conveying side 31 of the perforated belts 27, 28.

Located in front of the suction drum 17 in the conveying direction is a separate additional feed roller 59 which is located approximatly underneath the suction drum 17 and, as a result, provides the sheet of material 14 and the blank 11 with a generally larger surface of contact against the suction drum 17 (approximately three quarters of the periphery). The drawing rollers 15, 16 are arranged correspondingly offset laterally, specifically above the deflecting roller 29. An especially accurate and fault-free guidance of the sheet of material 14 and consequently of the blank 11 is thereby guaranteed even at high speeds.

Moreover, the perforated belts 27, 28 and deflecting roller 29 have a similar design to those of the preceding embodiments.

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# DEVICE FOR MANUFACTURING AND FEEDING PACKING BLANK

Claims of correspondent: **US4495746**

We claim:

1. A packaging apparatus for severing successive blanks (11) of desired length from a continuous web (14) of thin and delicate wrapping material and for individually conveying the blanks in succession to a packaging station (12, 13), comprising: (a) a rotatably driven, perforate suction drum (17), (b) means (15, 16) for supplying said web to the suction drum, (c) transverse severing means (18, 19) operatively associated with the suction drum for cutting the web into successive blanks, (d) means (20-24) for applying a vacuum to an outer surface of the suction drum over a predetermined peripheral zone of travel thereof to positively retain the web and blanks thereon throughout said zone, and (e) a blank conveyor (26) disposed between the suction drum and the packaging station, and comprising: (1) a pair of transversely spaced, parallel, endless, commonly rotatably driven, perforated (36) belts (27, 28), (2) respective upper and lower, parallel axes deflecting rollers (29, 30) mounting said belts, and (3) suction means disposed behind the belts along a conveying run thereof for applying a vacuum thereto to positively but releasably retain the blanks thereon throughout said run, (f) the suction drum being mounted such that a leading end portion of the peripheral zone thereof, in the direction of rotation, adjoins a trailing end portion of the conveying run of the belts to ensure the positive and continuous retention of the blanks without deformation during the transfer thereof from the drum to the belts, and (g) the packaging station being disposed sufficiently downstream of a transfer zone between the drum and belts that trailing ends of severed blanks have left said transfer zone before central portions of said blanks arrive at said packaging station.

2. Apparatus according to claim 1, wherein the suction drum abuts the perforated belts in the region of the upper deflecting roller.

3. Apparatus according to claim 1, wherein the suction drum abuts the perforated belts in the region of a conveying run (31) thereof.

4. Apparatus according to claim 1, further comprising a vent bore (25) operatively associated with the drum for terminating the drum vacuum just beyond the region of the transfer of the blanks to the belts.

5. Apparatus according to claim 1, wherein the deflecting roller (29) is subjected to suction in a peripheral region thereof for transporting the blanks.

6. Apparatus according to claim 5, wherein suction air is generated on the periphery of the upper deflecting roller in two spaced, groove segment regions (43) in communication with the perforated belts.

7. Apparatus according to claim 5, wherein the upper deflecting roller has a plurality of radial suction bores (46) which correspond to and cooperate with suction bores (36) in the perforated belts.

8. Apparatus according to claim 7, wherein the suction bores are subjected to suction air via an axially extending central bore (49) in the upper roller.

9. Apparatus according to claim 7, wherein the suction bores are connected to a vacuum source in a central bore of the roller only in a peripheral region thereof which serves to transport the blanks.

10. Apparatus according to claim 7, wherein the upper deflecting roller comprises a hollow cylinder (44) rotatably mounted proximate the radial suction bores (46) on a fixed support axle (45) having a central bore (49) subjected to suction.

11. Apparatus according to claim 10, wherein the support axle has an outwardly open segmental groove (47) which extends in a peripheral direction and with which the suction bores communicate, said groove communicating with the central bore via a radial bore (48).

12. Apparatus according to claim 1, wherein suction air is communicated to the blanks via the perforated belts by fixed suction segments (54, 55) extending partially around the periphery of the upper deflecting roller, said segments being open in a radially outward direction.

13. Apparatus according to claim 12, wherein the suction segments are of U-shaped cross-section and extend in peripheral grooves (56, 57) in the deflecting roller, and terminate flush with the peripheral

surface of the roller.

14. Apparatus according to claim 13, wherein the suction segments are continuations of suction chamber means (32, 33 34); disposed behind the belts.

15. Apparatus according to claim 1, wherein the suction drum is located directly above the upper deflecting roller (29), and one supply roller (16) of a pair of supply rollers (15, 16) is located directly above the suction drum in a common vertical axial plane.

16. Apparatus according to claim 1, wherein the perforated belts have rib-like elevations (41) which engage positively in corresponding depressions (42) in the deflecting rollers, one suction hole (36) being located between every two successive elevations (41).

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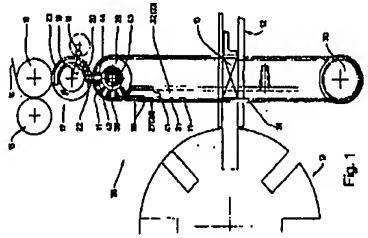

Fig. 1

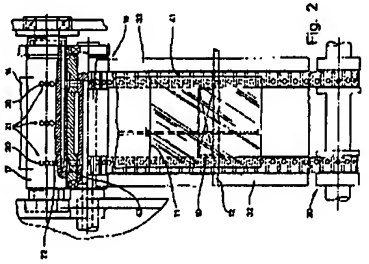

Fig. 2

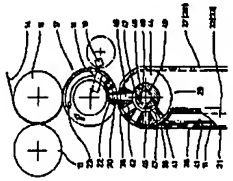

Fig. 3

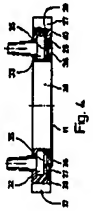

Fig. 4

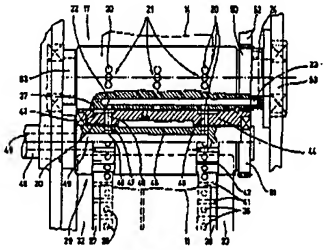

Fig. 5

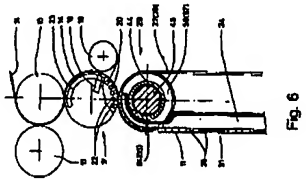

Fig. 6

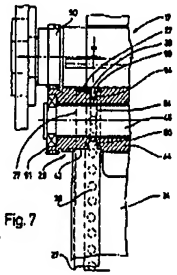

Fig. 7

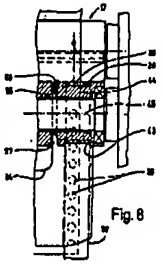

Fig. 8

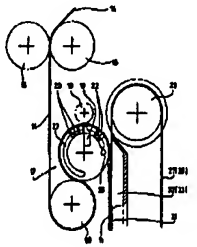

Fig. 9

⑲日本国特許庁（JP）　⑪特許出願公告

⑫特　許　公　報（B2）　平2－23412

| ⑤Int. Cl.⁵ | 識別記号 | 庁内整理番号 | ㉔㊹公告　平成2年(1990)5月24日 |
|---|---|---|---|
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| 11/08 | | 7609－3E | |

発明の数 1 （全9頁）

㊺発明の名称　包装用の素材を製造し送るための装置

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優先権主張　㉜1981年8月11日㉝西ドイツ(DE)㉛P3131687.5

㉗発明者　ハインツ・フオク　ドイツ連邦共和国フエアデン・モーアシユトラーセ64
㉗発明者　クルト・ライトケ　ドイツ連邦共和国フエアデン・トリフト18
㉗出願人　フオク・ウント・コムパニー　ドイツ連邦共和国．フエンデン．ジーメンシユトラーセ．10
㉔代理人　弁理士　八木田　茂　外2名
審判の合議体　審判長　山本　格介　審判官　松木　禎夫　審判官　町田　光信

㊻参考文献　特開　昭52－1581（JP，A）　実開　昭50－109384（JP，U）
特公　昭45－2117（JP，B1）　実公　昭47－2916（JP，Y1）
実公　昭53－7927（JP，Y2）

*1*

㊼特許請求の範囲

1　シート状の包装材料の連続したウエブ14から、所望の長さの素材11を次次に切断し、この素材を、個個に次次と包装ステーション12，13に輸送する装置において、

〔A〕　前記装置が、

(a)　回転駆動できる多孔の吸引ドラム17と、

(b)　前記ウエブを、吸引ドラムに供給するための手段15，16と、

(c)　吸引ドラムに作動的に関連する、ウエブを次次の素材に切断するための、横向きの切断手段18，19と、

(d)　吸引ドラムの予め定められた周区域に渉つて、吸引ドラムの外面に真空を加えて、前記周区域で、吸引ドラムにウエブおよび素材を積極的に保持するための手段20－24と、

(e)　吸引ドラムと包装ステーションの間に配置される素材コンベヤ26とを有し、

〔B〕　前記素材コンベヤが、

(a)　横方向に相離れ共通に回転駆動できる、一対の平行な無端状多孔ベルト27，28と、

(b)　前記ベルトを支持する、軸線の平行な2つの偏向ローラ29，30と、

(c)　無端状多孔ベルトの運搬側部分に沿つてこのベルトの背後に配置され、前記運搬側部分に真空の作用を付与する吸引手段とを有し、

〔C〕　吸引ドラムは、1つの偏向ローラ29の区域で、無端状多孔ベルト27，28に接するように配置され、前記の1つの偏向ローラ29が、少くとも素材の輸送に役立つ周区域で吸引空気を受けること、

を特徴とする包装用の素材を製造し送るための装置。

*2*

発明の詳細な説明

（産業上の利用分野）

この発明は、包装材料のシートからの切断によつて製造された包装用の素材を、包装ステーションに送るための、素材コンベヤを有し、この素材コンベヤが、側方配置の循環運動する多孔ベルトからなり、これら多孔ベルトの運搬側部分が、その後面に配置される吸引室によつて真空の作用を受ける、包装用の素材を製造し送るための装置に関する。

包装技術における必須要件を充すように経済的

な包装材料を処理するためには、箔またはこれから作られる素材を運搬の際に充分に固定するために特別の対策が必要である。同時に、包装材料の連続したシートから切断した素材で包装すべき物品を包むまでシートおよび素材の双方を確実に途切れなしに保持することが重要である。

（従来の技術）

この問題の最初の解決はドイツ連邦共和国特許公告第1167319号公報に見出される。この提案において材料シートは吸引ローラすなわち外胴面に開く吸引開孔を備えたローラに送られる。素材はこの吸引ローラにおいて回転切断ナイフによつてシート材料から切断される。個個の素材は次いで吸引ローラから同軸線の横並びの吸引円板に移送され、これは同様に吸引開孔によつて素材を横方向に固定する。物品（包装体）はこれら２つの吸引円板の間を通つて特に素材を同伴するようにして半径方向に動くことができ、その際に素材は滑りによつて吸引円板から引き離される。

素材の保持運搬部材として吸引円板を使用することは製造に費用が掛りかつ最大寸法が限定されるから望ましくない。加うるに、（適当に大きな寸法の）素材が吸引円板のまわりで実質的に輪になるときに吸引円板から素材を引き離すように包装体を送ることが極めて困難になる。

故に最近の解決（ドイツ連邦共和国特許第2530992号明細書およびドイツ連邦共和国特許公開第2949685号公報）では、多孔ベルトが使用されてこれの運搬側部分が適当な場所に固定される吸引室によつて真空にさせられ、これによつて素材が多孔ベルトで保持されかつこれに沿つて運ばれる。多孔ベルトによつて素材のための垂直平面の運搬径路が形成できる。この径路は必要な運搬包装部材を互に離すに充分な長さを持つことができる。また垂直の多孔ベルトに横向きに包装体を運搬することによつて素材は容易にこのベルトから引き離しできる。

（発明が解決しようとする問題点）

しかしながらこの種の多孔ベルトを備えた公知の装置では、材料シートを連続的に固定保持しながらこの材料シートから素材を切断するという問題はまだ最も可能な方式で解決されていない。

故にこの発明の基礎となる目的は、１方において材料シートおよび切断された素材が包装体などによつて受取られるまで簡単で作用的に信頼できる構造によつて確実に途切れなしに運搬されるようにする手段を提供し、他方において材料シートから素材を完全に簡単に切断できるようにする手段を提供することにある。



（問題点を解決するための手段）

この目的の達成のため、この発明によれば、素材コンベヤの手前に、多孔ベルトのための１つの偏向ローラの区域で多孔ベルトに接する吸引ドラムが配置され、吸引ドラムの区域で、素材がシートから切断でき、吸引ドラムによつて、素材が多孔ベルトに直接移送でき、前記の１つの偏向ローラが、少くとも素材の輸送に役立つ周区域で吸引空気を受ける。

（発明の作用および効果）

故にこの発明においては、２つの相異なる運搬系すなわち１方において素材を製造する切断のための吸引ローラおよび他方において素材を包装ステーションまで運搬する多孔ベルトが、吸引ドラムにおいて切断された素材を適当に密に隣接配置される吸引ベルトへ中間コンベヤなしに直接移送できるような空間的相互関係で配置される。円弧（偏向ローラの周の１部）の形の径路に沿う素材の運搬から平面の運搬径路（多孔ベルトによる）への移送は、多孔ベルトが偏向ローラの区域ですでに素材の下方を走るからこの発明では特に望ましい方式で達成される。

偏向ローラ上に素材を保持するための空気吸引作用は種類の方式で素材に加えられる。有利な実施例によれば、偏向ローラは望ましくは多孔ベルトの吸引開孔に対応する（半径向きの）吸引開孔を備える。この場合に空気吸引作用は偏向ローラの区域においても多孔ベルトを介して素材に伝えられる。

同じく有利な別の実施例によれば、多孔ベルトに付属する吸引室が多孔ベルトのための偏向ローラの区域内まで延長して偏向ローラのための吸引セグメントを形成する。この吸引セグメントはその外向きに開いた側部で素材を（直接にまたは多孔ベルトを介して）保持できるような方式で偏向ローラの周溝の中に延長する。

この発明の別な特色は、吸引ドラム、多孔ベルトおよびその偏向ローラの設計に関する。

（実施例）

5　　6

この発明の実施例について図面を参照しながら以下に説明する。

図示の装置は例えば巻たばこ包装体１０を製造するための包装機械の１部であつて、主として市販されている巻たばこ包装体１０は外方包みを備え、これはこの場合に包装上問題がある低廉なプラスチツク箔からなる。そのため包装材料の素材１１は巻たばこ包装体１０の輸送方向に横向きの平面内で包装体軌道１２に沿つて保持されて、素材１１は相対運動によつて巻たばこ包装体１０のまわりをU形に包む。このようにして素材１１を備えた巻たばこ包装体は次いで折曲げタレツト１３の中へ運搬され、これによつて周知の方法で素材１１の必要な折曲げが達成される。

素材１１は連続的に（または間欠的に）送られる包装材料のシート１４から次次に切断される。この材料シートは後続の運搬部材の上方に取付けられた１対の引張りローラ１５，１６によつて運搬される。材料シート１４は、引張りローラ１６の周のほぼ半分に沿つて運搬されたのちに直接隣接するすなわち密接する軸線の平行な吸引ドラム１７に移される。

吸引ドラム１７上で素材１１は後続の材料シート１４から切断される。この実施例ではほぼ半径向きの切断ナイフ１８が吸引ドラム１７の中にほぼ半径的に埋められ、その際に外刃は吸引ドラム１７の胴面から突出するようにされる。切断は予め定められた繰返し切断点で回転式対向ナイフ１９によつて達成され、故に常に同じ長さの素材が切断される。上述した切断具も種類の方式で設計できる。

回転吸引ドラム１７は互に同じ間隔で配置されるいくつかの特に３つの吸引列２１でこの吸引ドラム１７の胴面に開く半径向き吸引開孔２０を備え、この吸引開孔は空気吸引作用を適当に受けたときに材料シート１４または素材１１を固定する。３つの吸引列２１の吸引開孔２０はそれぞれ軸線に平行な共通の吸引通路２２に連結され、これら吸引通路２２は吸引ドラム１７の軸線方向端部に達し、ここで、吸引ドラム１７に隣接して取付けられた定置の分配円板２４に形成されている吸引溝２３に周期的に連通する。吸引溝２３は吸引ドラム１７上の材料シート１４または素材１１のほぼ半円状の運搬区域の全体に渉つて延長する。望ましくは下方区域で分配円板２４には溝２３から離れている通気開孔２５が形成され、これはこの区域での吸引通路２２従つて吸引開孔２０の通気の結果として後続の素材コンベヤ２６への素材の移送を容易にする。

この素材コンベヤ２６によつて素材１１は直線にすなわち垂直平面内で輸送される。そのため素材コンベヤ２６は互に同一間隔で離れるように配置される２つの多孔ベルト２７および２８からなる。これらは上方および下方の偏向ローラ２９，３０のまわりを案内される。この場合に偏向ローラ２９および３０は両側ですなわち上方および下方で包装体軌道１２からほぼ等しい距離だけ離れるように配置される。

多孔ベルト２７，２８は運搬側部分３１の区域で特に各運搬側部分３１に対する個個の細長い吸引室３２および３３によつてまたは共通の吸引箱３４（第６，７，８図）によつて空気吸引作用を受ける。吸引室３２，３３は運搬側部分３１に面する側に多くのオリフイスまたは連続吸引スリツト３５を備え、これは多孔ベルト２７，２８の運搬側部分３１によつておおわれる。吸引スリツト３５の区域で多孔ベルト２７，２８は吸引開孔３６を備え、これは運搬側部分３１の反対側での吸引室３２，３３または吸引箱３４による真空の作用を可能にし、これによつて素材１１はこの輸送の際に固定される。

特に第４図から明らかなように、この実施例では吸引室３２および３３は２つの垂直な支持要素３７の中に形成され、これら支持要素の間に巻たばこ包装体１０を押し通すための空所３８が形成される。この押し通し運動の際に素材１１は巻たばこ包装体１０によつて多孔ベルト２７，２８の運搬側部分３１から引き離される。

多孔ベルト２７，２８は吸引室３２，３３または吸引箱３４の樋状くぼみ３９の中を走る。このせまいくぼみ３９はこれの中を走る多孔ベルト２７，２８が素材１１に面する接触面４０とほぼ平らになるように形成される。多孔ベルト２７，２８の吸引開孔３６および吸引室３２，３３のための吸引スリツト３５はこれら部分の長手中央平面に関して内向きに食い違うように配置される。

多孔ベルト２７，２８は偏向ローラ２９および３０に向つて曲がる内面に横向きのリブ状隆起４

1を備え、その結果として多孔ベルト27，28は歯付きベルトとして形成される。少くとも上方の偏向ローラ29は対応するくぼみ42を備え、これの中に隆起41が積極的に係合する。これによれば、偏向ローラ29，30に対して滑りなしの多孔ベルト27，28の正確な運動が確実に達成される。くぼみ42は備向ローラ29，30の内曲げ部分43の区域に形成される。この内曲げ部分すなわち平らな溝43は多孔ベルト27，28がこれの中にはまりかつそのときに少くとも偏向ローラ29の胴面と実質的に平らになるように形成される。吸引開孔36は各2つの隆起41の間に配置される。

この実施例は、吸引ドラム17による材料シート14の受け取りから巻たばこ包装体への素材11の移送までのあいだ空気吸引作用による関連運搬部材への材料シート14および素材11の連続した途切れない固定が確実に達成されるように設計される。吸引ドラム17において形成された素材11の素材コンベヤ26への移送は特別の方式で達成される。

第1図およびその他の図による実施例において、素材コンベヤ26の上方偏向ローラ29は胴面の区域で特に少くとも素材11の運搬に役立つ周区域で空気吸引作用を受ける。望ましくは空気吸引作用はここでは多孔ベルト27，28を介して素材11まで作用し、従つて素材11はすでに偏向ローラ29の区域で多孔ベルト27，28によつて確実に輸送される。

図示の実施例において、偏向ローラ29は固定の支持軸45に回転可能に取付けられた中空円筒体44からなる。この支持軸は同時に偏向ローラ29に真空を付与する役をする。中空円筒体44は半径向き吸引開孔46を装備し、そのおのおのは多孔ベルト27，28の吸引開孔36の区域で中空円筒体44の胴面に開く。吸引開孔46は支持軸45の真空系すなわち吸引開孔46の区域で周方向に延長する弧状溝47に連結される。これは吸引開孔46が素材11の輸送の区域に渉つて弓形溝47に連結されるように形成され配置される。この弧状溝は次いで支持軸45の中を軸線方向に延長する中央開孔49に半径向き開孔48を介して連結される。故に中央開孔49を真空源に連結させると弧状溝47は常に空気吸引作用を受ける。素材11は吸引ドラム17に最も接近した偏向ローラ29の上方区域でこの偏向ローラによつて引き取られる。偏向ローラ29に沿う輸送はほぼ1/4円に渉つて行なわれる。

上述した輸送装置の設計によれば、材料シートおよび素材が互に隣接する弧状軌道に沿つて多孔ベルトで受け取られるまでこれらが輸送されるような方式で運搬部材の望ましい配備が充分に達成できる。そのため第1図から第8図の実施例では、偏向ローラ29、吸引ドラム17および引張りローラ16が共通の軸線平面内で上下に配置される。その結果として第5図から特に明らかなようにこれら運搬部材の望ましい同期駆動が可能になる。吸引ドラム17と偏向ローラ29は歯車50，51を介して直接に作動的に係合する。別の歯車52は引張りローラ16を駆動する役をする。吸引ドラム17は両端で連続の軸53に取付けられる。ここで偏向ローラ29の支持軸45は1側で取付けられる。

第6図から第8図による実施例は原理的に第1図から第5図によるものと同様に設計される。これでは素材11は別の方式で空気吸引によつて上方の偏向ローラ29に固定される。特に第6図から明らかなように、ここで設けられる吸引箱34は特に円孤の形状に形成され吸引箱34に隣接するせまい吸引セグメント54，55によつて偏向ローラ29の区域まで長くされる。これはここでは実際上U形横断面の比較的せまい樋形空気輸送部材として形成される。固定の吸引セグメント54，55は偏向ローラ29に設けられた対応の形状および寸法の周溝56および57の中に延長する。これにおいて寸法の差異は、偏向ローラ29が吸引セグメント54，55に対して自由に回転できるように選択される。吸引セグメント54，55の半径方向は開いていてかくして吸引スリット58を形成する。

第7図の実施例において、吸引セグメント54は多孔ベルト27，28すなわちこれらの吸引開孔36の区域の直下を延長する。故にこの場合には第1図から第5図による実施例と同様に、多孔ベルト27，28は偏向ローラ29の区域で空気吸引作用を受け、従つてそれらは素材に対するそれらの運搬および固定の作用を達成できる。

第8図による実施例では素材の固定および運搬

は偏向ローラ２９の区域で互に分離している。ここでは吸引セグメント５５は多孔ベルト２７，２８に対して横向きにすなわち内方へ食い違うように配置される。そのため吸引セグメント５５は偏向ローラ２９の胴面と実質的に平らであつて従つて吸引スリット５８は素材１１に直接作用できる。

さらにこの場合に運搬部材１６，１７，２９は前述した実施例の場合と同じまたは同様に相対配置される。吸引箱３４は多孔ベルト２７，２８の案内に関して吸引室３２，３３と同様に設計される。

**図面の簡単な説明**

第１図はこの発明による装置の１部垂直断面による簡略化した側面図、第２図は第１図の装置の同じく１部垂直断面による90°偏向の正面図、第３図は第１図および第２図の装置の上方区域を拡大して側面図および垂直断面図で示す図、第４図は多孔ベルトおよび吸引室の区域を拡大して示す水平断面図、第５図は第３図に示される部分の詳細を90°偏向させて示す正面図、第６図は別の実施例を示す第３図に対応する図、第７図は第６図の実施例を90°偏向させ１部断面で示す正面図、第８図は変型実施例を示す第７図に対応する図である。

図面において、１１は素材、１４は材料シート、１５と１６は引張りローラ、１７は吸引ドラム、２５は吸引開孔、２６は素材コンベヤ、２７と２８は多孔ベルト、２９と３０は偏向ローラ、３２と３３は吸引室、３３と３４は吸引箱、３６は吸引開孔、４１は隆起、４２はくぼみ、４４は中空円筒体、４５は支持軸、４６は吸引開孔、４７は弧状溝、４８は半径向き開孔、４９は中央開孔、５４と５５は吸引セグメント、５６と５７は周溝を示す。

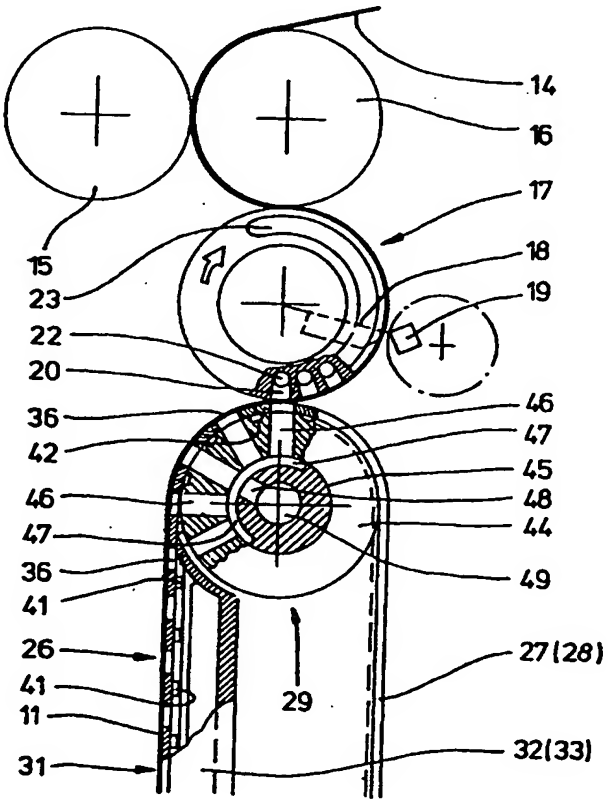


Fig. 3

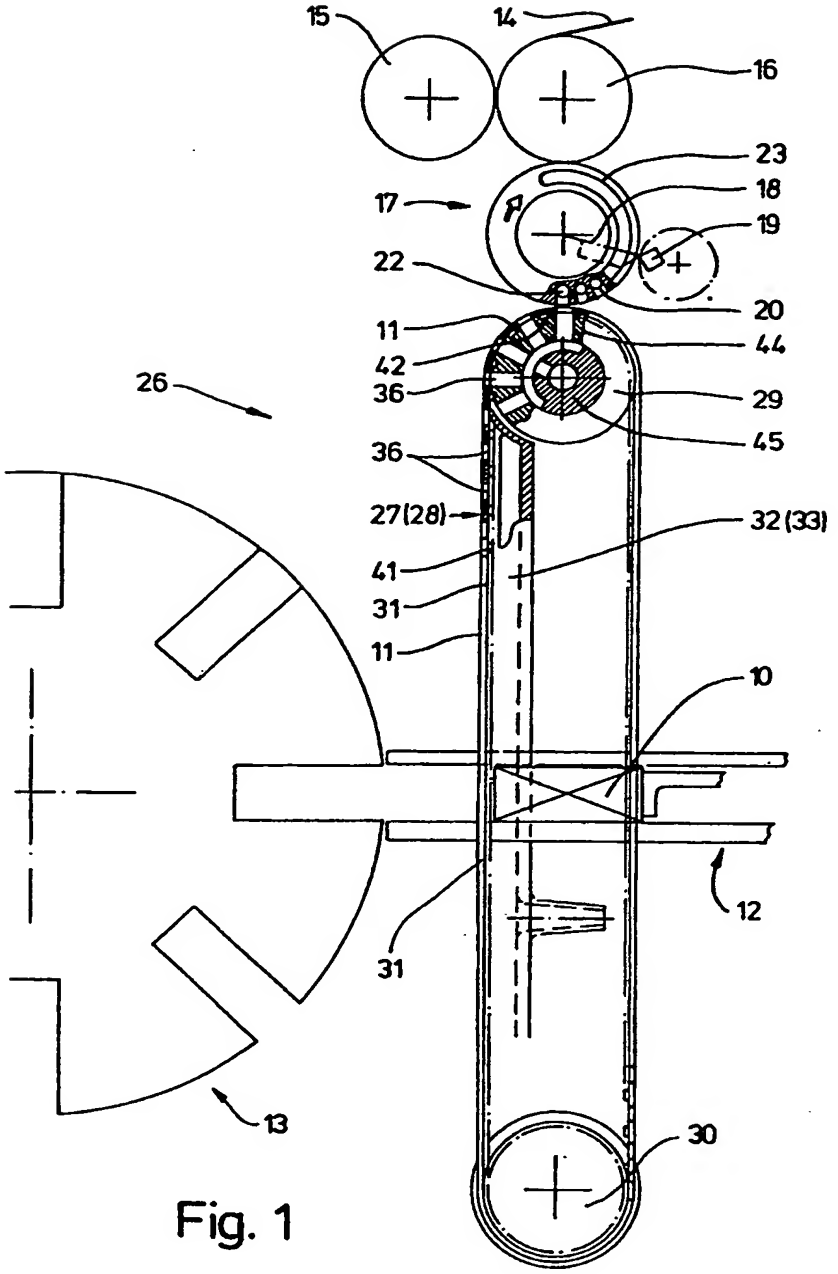
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Fig. 1

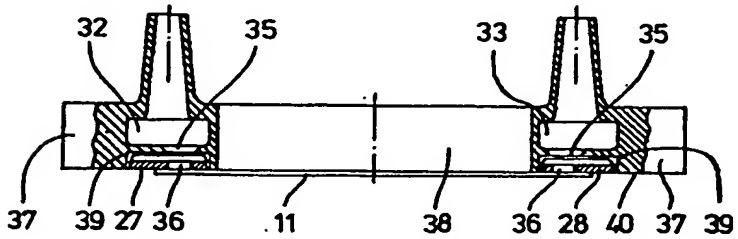
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Fig. 4

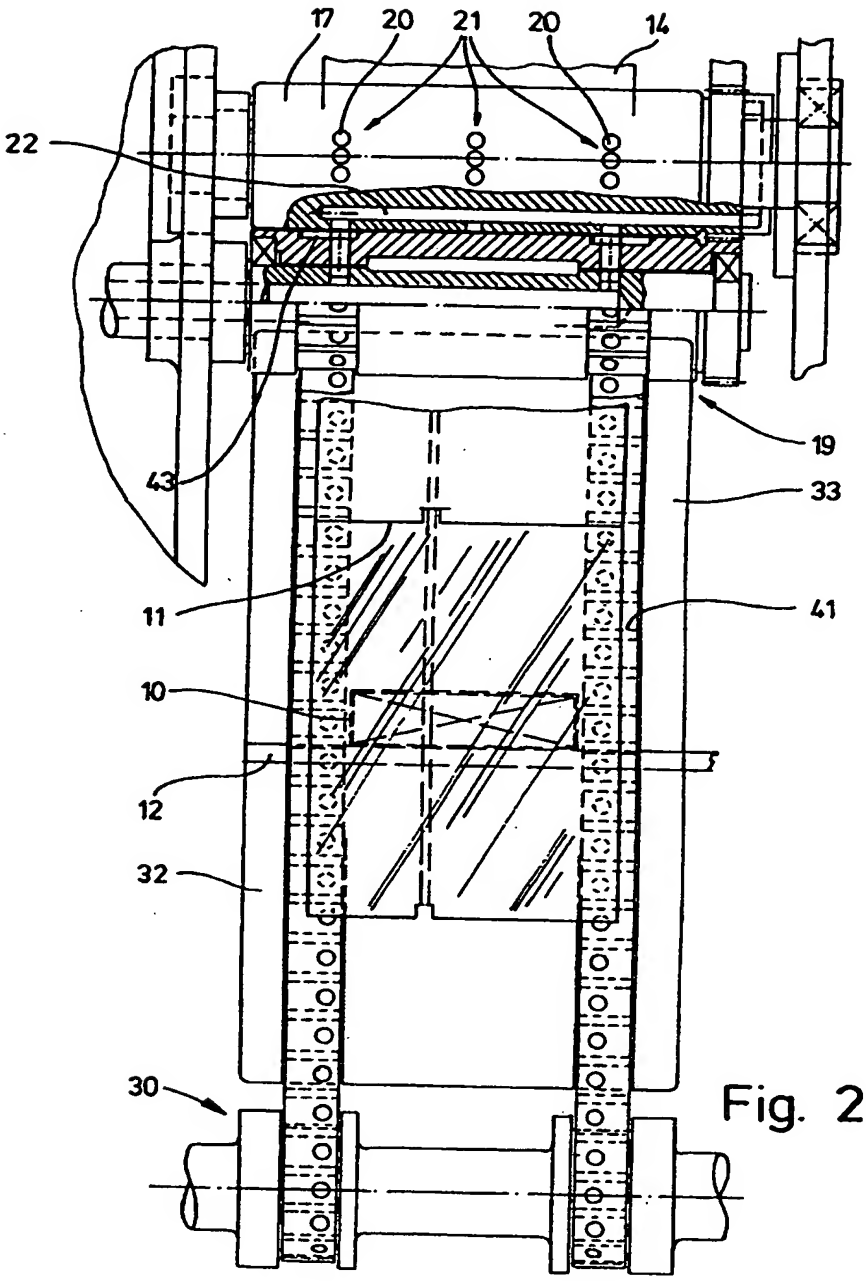


Fig. 2

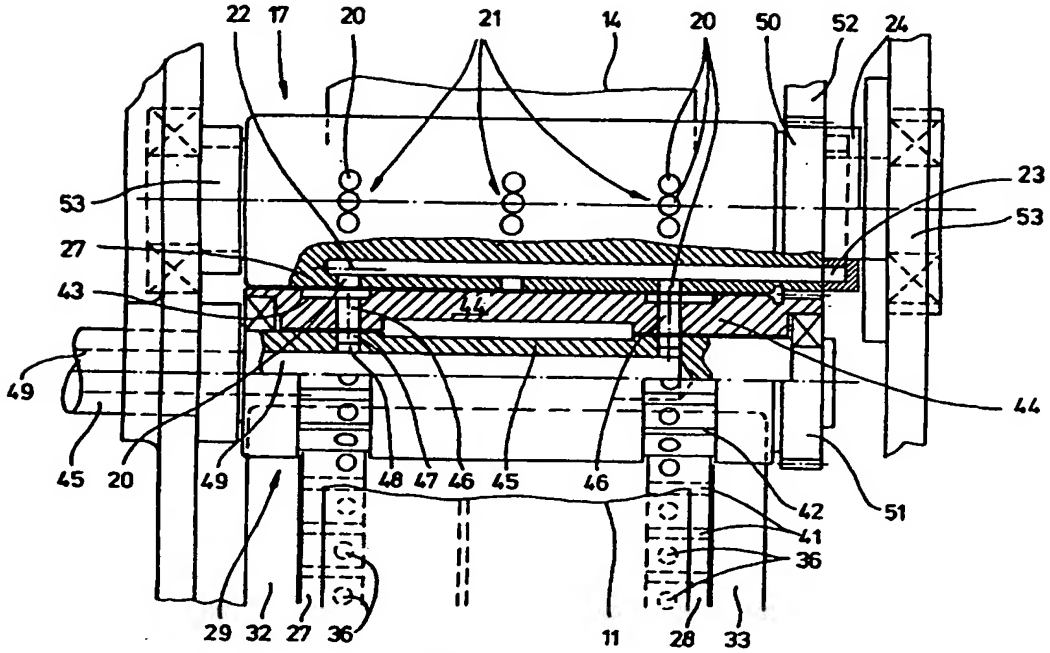
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Fig. 5

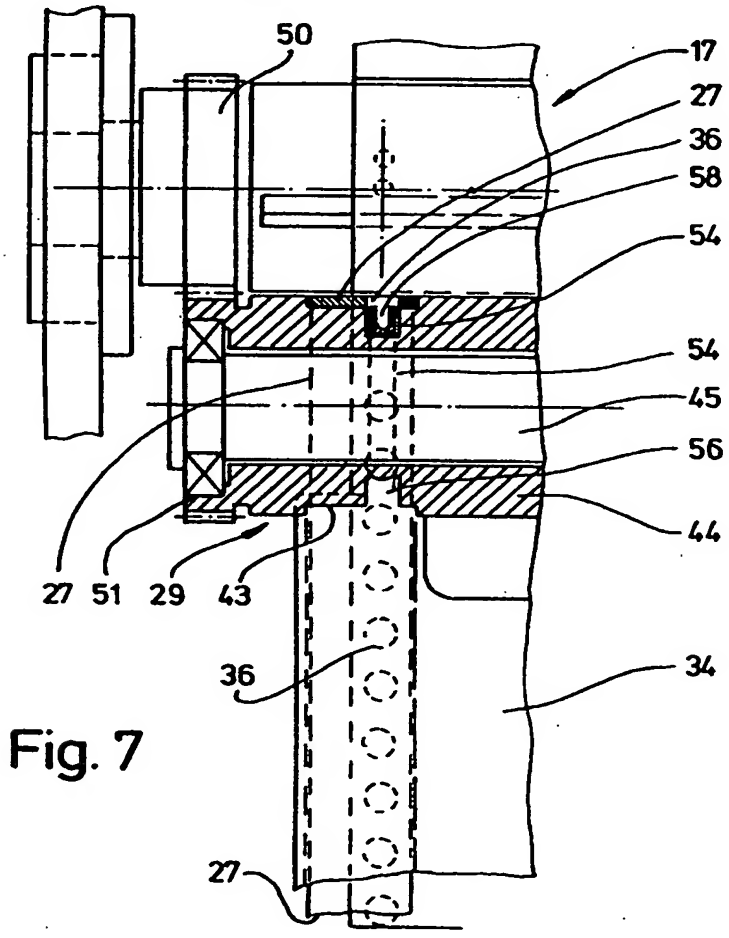
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Fig. 7

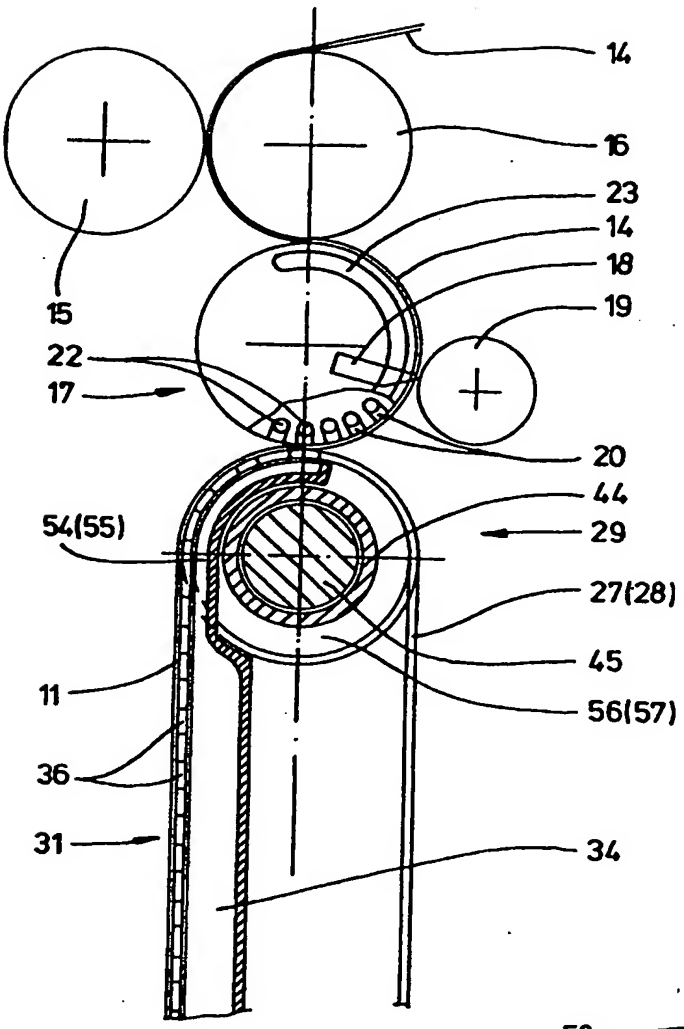
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Fig. 6

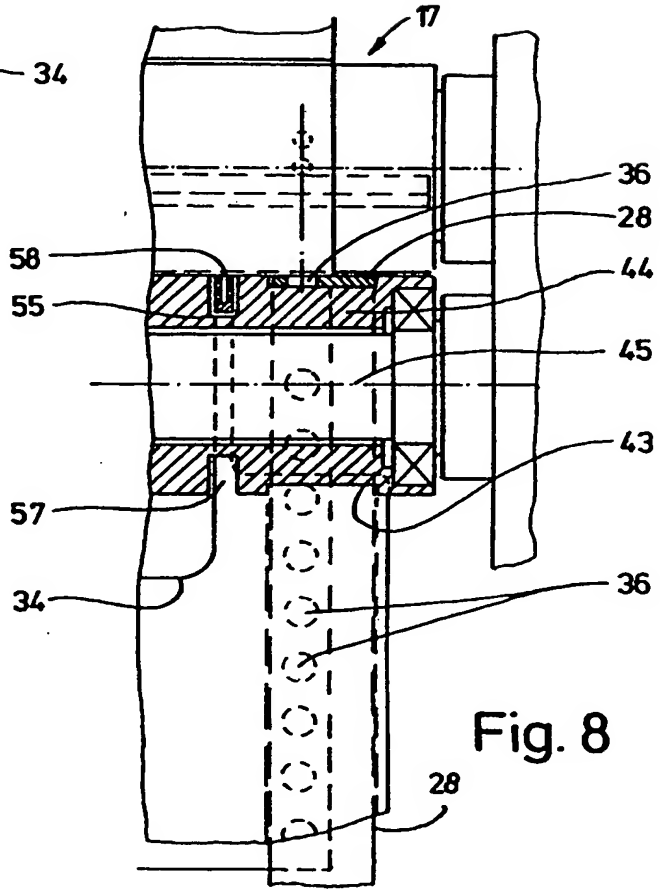
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Fig. 8